

REMARKS

Claims 1-52 are pending in the application. Claims 35 and 36 are cancelled.
Applicants respectfully request for allowance of all the pending claims.

Claim Objections

Claims 34 and 35 are objected to as being substantial duplicates of claims 6 and 7. Applicants believe that Examiner meant to say claim 36 instead of claim 34, and would appreciate Examiner's correction if it is not the case. Based on the belief, Applicants cancel claims 35 and 36, and therefore respectfully submit that the objections are overcome.

Rejections under 35 U.S.C. § 103

Claims 1-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP Patent Application No. 0919726 to Leyshon (hereinafter referred to as "Leyshon") in view of US Patent No. 5,553,998 to Muhlhoff (hereinafter referred to as "Muhlhoff").

Independent claim 1 is directed to a vacuum pump comprising a first pumping section, a second pumping section downstream from the first pumping section, a third pumping section downstream from the second pumping section, a first pump inlet through which fluid can enter the pump and pass through each of the pumping sections towards a pump outlet, and a second pump inlet through which fluid can enter the pump and pass through only the second and the third pumping sections towards the outlet, wherein the third pumping section comprises a helical groove formed in a stator thereof, and at least one of the first and second pumping sections comprises a helical groove formed in a rotor thereof.

Examiner acknowledges that Leyshon does not teach “at least one of the first and second pumping sections comprises a helical groove formed in a rotor thereof,” but asserts that it would have been obvious to one having ordinary skills in the art at the time the invention was made to modify the apparatus of Leyshon by adding a helical groove formed in a rotor thereof after the first pumping section as taught in Muhlhoff.

Applicants respectfully disagree with the assertion.

Muhlhoff teaches a friction pump 35 having a rotor 37 provided with a web structure 39 around its central axis. *See, col. 3, lines 29-34.* The central part of the rotor 37 is required to be in a conical shape to ensure that the width of web structure 39 decreases from the suction side towards the pressure side. *See, col. 3, lines 34-37.* Muhlhoff even goes further by advising to keep the conical shape extends continuously beyond the friction pump 35. *See, col. 3, lines 38-41.*

It would not have been obvious to add Muhlhoff’s friction pump 35 that requires a conical shaft to the vacuum pump taught by Leyshon. As illustrated in the drawing of Leyshon, the shaft 2 appears to be in a cylindrical shape and drive both the first and second pumping sections 6 and 7. The gist of Leyshon is to make the second pumping section 7 larger than the first pumping section 1, such that the pump overall suits the pressure requirements of different systems attached to the first and second inlets, respectively. *See, abstract.* Replacing Leyshon’s second pumping section 7 with Muhlhoff’s friction pump 35 would result in a smaller gas flow space, because the conical shaft would crowd out the space that otherwise could be utilized by rotor blades. Due to the peculiar shape requirement, it would not have been obvious for a person skilled in the art to incorporate Muhlhoff’s friction pump 35 in Leyshon’s vacuum pump.

As such, claim 1 is patentable over Leyshon and Muhlhoff under 35 U.S.C.

103(a). For the same reasons as discussed above, independent claim 14 is also patentable over Leyshon and Muhlhoff under section 103. Accordingly, claims 2-13 and 15-52 that depend from claim 1 or 14 and include all the limitations recited therein are patentable over Leyshon and Muhlhoff, as well.

CONCLUSION

Applicants have made an earnest attempt to place this application in an allowable form. In view of the foregoing remarks, it is respectfully submitted that the pending claims are drawn to a novel subject matter, patentably distinguishable over the prior art of record. Examiner is therefore, respectfully requested to reconsider and withdraw the outstanding rejections.

Should Examiner deem that any further clarification is desirable, Examiner is invited to telephone the undersigned at the below listed telephone number.

Applicant does not believe that any additional fee is due, but as a precaution, the Commissioner is hereby authorized to charge any additional fee to deposit account number 50-4244.

Respectfully submitted,

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